REMARKS

Applicants submit this Amendment in reply to the Office Action dated October 1, 2003. As an initial matter, Applicants gratefully acknowledge the Examiner's indication of the allowability of the subject matter of claim 4. Applicants have rewritten claim 4 into independent form to include the subject matter of the base claim and any intervening claim. However, Applicants note that the rewriting of dependent claim 4 into independent form is not an admission that the underlying base and/or intervening claims are unpatentable over the cited references. To the contrary, as set forth below, Applicants assert that at least independent claim 1 is patentable over the cited references. Nevertheless, in the interests of expediting the prosecution of this application, Applicants have rewritten claim 4 into independent form. Accordingly, Applicants submit claim 4 is now in *prima facie* condition for allowance.

In this Amendment, Applicants have additionally amended claims 1, 2, and 15 solely to improve grammatical clarity, and added new claims 18-20 to better define the claimed invention. Claims 1, 4, and 20 are independent claims.

Before entry of this Amendment, claims 1-17 were pending in this application, with claims 5-14 and 16 having been withdrawn from consideration. After entry of this Amendment, claims 1-20 are pending in this application, with claims 5-14 and 16 still having been withdrawn from consideration.

The originally-filed specification, claims, abstract, and drawings fully support the subject matter of amended claims 1, 2, 4, and 15 and new claims 18-20. Specifically, support can be found at least in Fig. 2, page 10, lines 8-14, and the originally-filed claims. No new matter was introduced.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

In the Office Action, the Examiner rejected claims 1, 3, 15, and 17 under 35 U.S.C. §102(e) as being anticipated by Matsumoto (U.S. Patent No. 6,358,361) ("Matsumoto"), and rejected claims 1-3, 15 and 17 under 35 U.S.C. §102(e) as being anticipated by Suzuki et al. (U.S. Patent No. 6,497,783) ("Suzuki"). Applicants respectfully traverse these rejections. For anticipation under 35 U.S.C. §102, the reference must teach every aspect of the claimed invention either explicitly or implicitly. M.P.E.P. 706.02. Because neither Matsumoto nor Suzuki teaches every aspect of claims 1-3, 15, and 17 either alone or in combination with the other aspects of the claimed invention, neither Matsumoto nor Suzuki anticipate any of those claims.

Neither Matsumoto nor Suzuki discloses or suggests the invention claimed in independent claim 1. For example, independent claim 1 recites a plasma processing apparatus including, among other aspects, "a traveling-wave generator associated with the annular waveguide, the traveling-wave generator being configured to produce a traveling wave in a form of an endless ring in the annular waveguide." Neither Matsumoto nor Suzuki discloses at least this aspect of the claimed invention either alone or in combination with the other aspects of the claimed invention.

Matsumoto discloses a plasma processing apparatus with a ring member 10 attached to the upper end of a reactor 1. The ring member 10 supports the annular seal plate 4, and has attached on its upper surface a cylindrical block member 25. An annular waveguide antenna member 12 is formed within the cylindrical block member 25. A waveguide 31 is connected to a microwave generator 30 on one end and a guide portion 13 on the other end which leads to antenna member 12. (Figs. 3-4; col. 7, line 25 through col. 8, line 12).

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

> The microwave introduced into the annular waveguide antenna portion 12 then propagates within the dielectric 14 inside the annular waveguide antenna portion 12 as progressive waves traveling in the annular waveguide antenna portion 12 in opposite directions to each other. Both progressive waves meet each other at a point within the annular waveguide antenna portion 12 diametrically opposite to the guide portion 13, forming a **standing wave**."

(Col. 8, lines 2-12; emphasis added).

Suzuki discloses a container 1 with a microwave supply means 3 and a dielectric window 4. The microwave supply means 3 has an annular waveguide 3a with a plurality of slots 3b. A microwave is introduced by the microwave supply means 3 through microwave introducing slot 13 into the annular waveguide 3a. (Figs. 1-2; col. 6, lines 43-64).

> The microwaves introduced through the microwave introducing port 13 have their course changed so as to fork clockwise d2 and counterclockwise d1. Each slot is provided so as to cross the microwave traveling directions d1 and d2 so that the microwaves travel while being emitted through the slots.
>
> Since the annular waveguide has no terminals and is endless, the microwaves, which propagate in the directions d1 and d2, interfere mutually to generate **standing waves** of a predetermined mode.

(Col. 7, lines 41-50; emphasis added)

Neither Matsumoto nor Suzuki discloses or suggests any plasma processing apparatus having, *inter alia*, "a traveling-wave generator associated with the annular waveguide, the traveling-wave generator being configured to produce a traveling wave in a form of an endless ring in the annular waveguide" as set forth in independent claim 1. Indeed, the structures described in Matsumoto and Suzuki have the same problems the claimed invention is trying to solve, namely that because the wave is divided when it is propagated into the antenna portion, **only standing waves** which flow in both

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

directions within the antenna member are formed. **Standing waves** cause undesirable variability in the electromagnetic field within the processing container, and thus prevents the uniform deposition of plasma on the wafer. (Page 2, lines 17-28). In contrast, the invention as recited in claim 1, includes **traveling waves**, which are different from **standing waves**.

> Note, since the microwave traveling in the annular antenna 73 is not a standing wave, but a traveling wave rotating in the annular antenna in the form of an endless ring, an electromagnetic field emitted from the slots 754 becomes uniform in the circumferential direction of the annular antenna 73. Accordingly, it is possible to produce a remarkably uniform plasma in the processing container 53, allowing an uniform processing to be applied on even a large-diameter wafer.

(Page 10, lines 17-22). Accordingly, because neither Matsumoto nor Suzuki discloses every aspect of the invention either alone or in combination with the other aspects of the claimed invention, Applicants respectfully request the allowance of independent claim 1 and its respective dependent claims, including newly added dependent claims 18 and 19.

Applicants also assert that neither Matsumoto nor Suzuki teaches or suggests every element recited in independent claim 20. For example, independent claims 20 recites, among other aspects, "a wave generator associated with the annular waveguide, the wave generator being configured to produce a unidirectional wave in a form of an endless ring in the annular waveguide." Because both Matsumoto and Suzuki disclose bi-directional standing waves in the annular waveguide as set forth above, neither Matsumoto nor Suzuki teaches or suggests at least this aspect of the invention either alone or combination with the other aspects of the claimed invention. Accordingly, Applicants respectfully request the allowance of independent claim 20.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

Applicants further submit that claims 1-3, 15, and 17-19 depend from one of independent claims 1, 4, and 20 and are therefore allowable for at least the same reasons that each of those respective independent claims is allowable. In addition, at least some of the dependent claims recite unique combinations that are neither taught nor suggested by Matsumoto, Suzuki, or the cited art, and therefore at least some also are separately patentable.

Furthermore, upon the allowance of independent claims 1 and/or 4, Applicants respectfully request rejoinder and consideration of the withdrawn claims that depend from independent claims 1 and/or 4, respectively, as set forth in M.P.E.P. 809.02(c).

In view of the foregoing remarks, the claimed invention is neither anticipated nor rendered obvious in view of the prior art references cited against this application. Applicants therefore request the entry of this Amendment, the Examiner's reconsideration and reexamination of the application, and the timely allowance of the pending claims.

The Office Action contains characterizations of the claims and the related art with which Applicants do not necessarily agree. Unless expressly noted otherwise, Applicants decline to subscribe to any statement or characterization in the Office Action.

In discussing the specification, claims, abstract, and drawings in this Amendment, it is to be understood that Applicants are in no way intending to limit the scope of the claims to any exemplary embodiments described in the specification or abstract and/or shown in the drawings. Rather, Applicants are entitled to have the claims interpreted broadly, to the maximum extent permitted by statute, regulation, and applicable case law.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

Please grant any extensions of time required to enter this response and charge any additional required fees to our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P.

Dated: December 22, 2003

By: _____
Michael W. Kim
Reg. No. 51,880

Attachments: Two (2) Replacement Sheets including Figs. 17-19.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

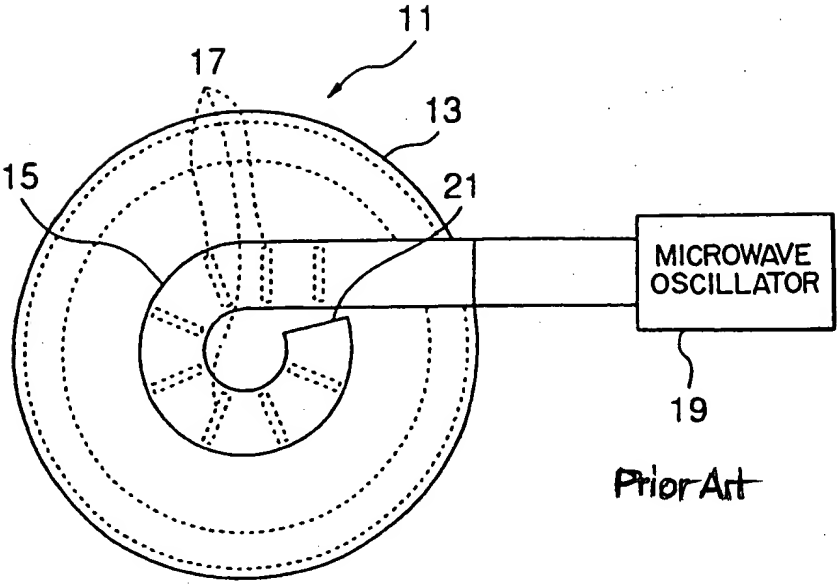


FIG. 17

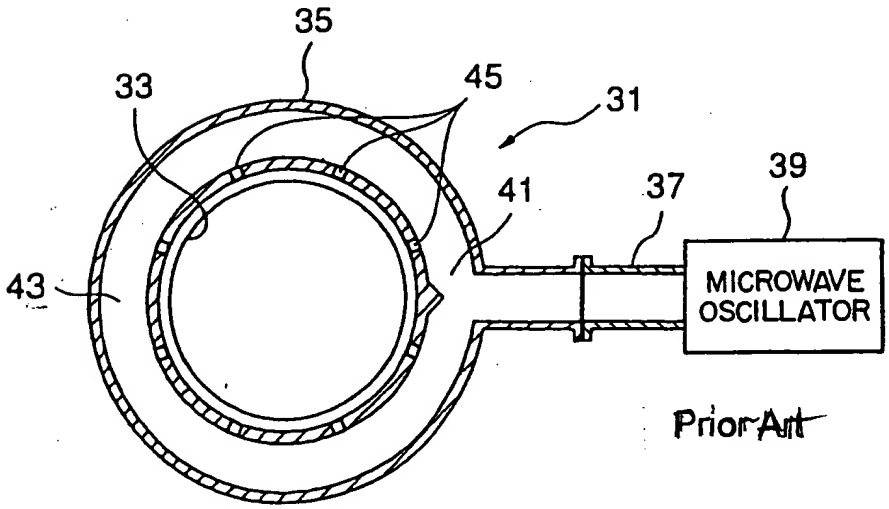
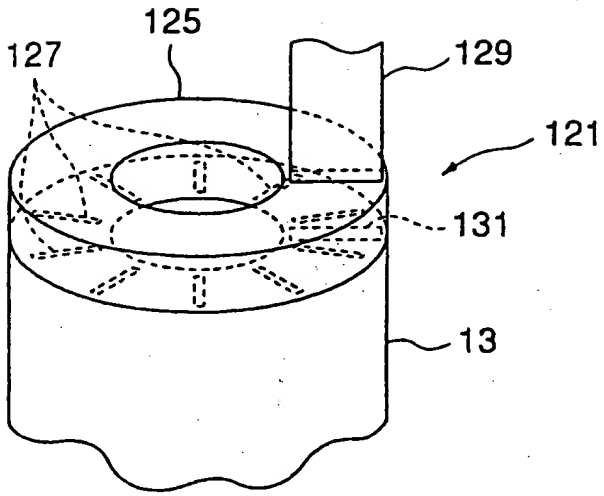


FIG. 18

Approved
03-10-04



Prior Art

FIG. 19